4.7 HAZARDOUS MATERIALS, SITE CONTAMINATION AND POLLUTION PREVENTION

This section identifies potential impacts from hazardous materials and site contamination from each of the four action alternatives, and proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to hazardous materials and site contamination if it would:

- Hamper on-going, planned or needed remediation at Ames Research Center.
- Expose people or currently uncontaminated soil or water to unacceptable levels of existing contamination through construction, demolition, or other activities.
- Result in unacceptable handling, use or disposal of hazardous materials.

B. Impact Discussion

This section discusses potential impacts from hazardous materials and site contamination for each of the five proposed alternatives. Additional information on impacts related to toxic air contaminants is contained in Section 4.4 of this EIS.

1. Remediation at Ames Research Center

As noted in Section 3.7, the US Navy's occupation of Moffett Field left a legacy of site contamination, primarily from petroleum products and solvents. NASA has also created some contamination on the Ames Campus. The plume of groundwater contamination from the MEW Superfund site, which is south of Ames Research Center, has also spread under a substantial portion of the NRP and part of the Ames Campus areas. Remediation efforts are thus a crucial part of the responsible stewardship of Ames Research Center, and must be

facilitated wherever possible. New development associated with the NADP must not hamper on-going or future remediation efforts.

Under each of the alternatives, the existing street and building site layout in the NRP area would be substantially altered, which could lead to conflicts with existing piping and monitoring wells. If any changes to the remediation system were necessary, the Navy's or MEW Companies' contractors would complete, at the project developer's expense, the design and implementation. Changes could include closure of existing groundwater wells, development of new wells, and relocation of pipelines or other system components. The project developer would work with the Navy's and MEW Companies' contractors to coordinate the schedule for completion of EPA- and Regional Water Quality Control Board-approved remediation with the developer's construction schedule.

Under Alternatives 1 through 5, portions of the existing pipe system for the remediation of the Regional Plume would be reconfigured to accommodate new construction in order to allow full access to these pipes. In addition, NASA and developers in the NRP area would site new buildings so as to interfere with existing monitoring wells to the minimum extent possible. If monitoring wells did need to be relocated, NASA and the developer would work with the Navy, the MEW Companies, the Regional Water Quality Control Board, and US EPA to determine the best new location for the well. The actual relocation of MEW wells would be conducted by the MEW's contractor at the expense of the developer. For Navy wells, the developer would contract directly with the Navy's contractor for needed relocations. This work, and proposed construction and demolition throughout Ames Research Center, would be coordinated through the Remediation Project Manager in the Office of Environmental Services to ensure that none of the proposed construction, demolition, and infrastructure improvement projects hampered any of the on-going, planned, and foreseeable remediation efforts at the ARC.

2. Exposure to Existing Contamination

This section describes potential exposure to existing sources of contamination at Ames Research Center.

a. Asbestos, Lead, PCBs and Mold

Under Alternatives 2 through 5, there would be a risk of exposing construction workers to asbestos, lead, or PCBs as existing buildings were rehabilitated or demolished, since most buildings constructed before 1978 are likely to contain asbestos containing materials (ACMs), lead-based paints, and/or PCB's. As per current NASA policy, an ACM/lead/PCB survey would be conducted on all buildings and structures prior to demolition or rehabilitation to confirm that ACM/lead/PCB concentrations were not above regulatory limits. If any ACM materials, lead, or PCBs were discovered at concentrations above the regulatory limits, US EPA, BAAQMD, DTSC, and OSHA requirements would be implemented to ensure containment during demolition and rehabilitation. NASA has prepared a draft plan for meeting agency remediation requirements for lead in the soil.

NASA is also preparing Closure Plans for the buildings to be demolished in the NRP area under Alternatives 2 through 5 to document levels of contamination before demolition begins. In addition to information about contamination from the Regional Plume, the Closure documents will describe PCBs and other hazardous materials, as well as any residual soil contamination from sumps, tanks, etc. Results of lead and asbestos surveys will be documented separately. As part of the Closure Plan process, any needed sampling to more accurately assess the level and extent of contamination in the buildings to be demolished and their immediate surroundings will be conducted. The Closure Report, the final step in this process, will be prepared after buildings are demolished and will describe how all hazardous materials have been safely disposed of or remediated.

Lastly, there is a possibility that construction workers renovating some of the historic buildings in the Shenandoah Plaza Historic District could be exposed

to mold that could cause health problems. There are no health standards or regulations for mold and related biological indoor air quality concerns.[1] However, NASA has developed procedures to minimize exposure to mold during renovation work. These procedures would be followed.

b. Pesticides

As described in Section 3.7, recent soil samples from the Bay View area have found the pesticide dieldren in concentrations above risk-based soil screening levels. Dieldren is not volatile so the only risk of exposure would be from physical contact with or ingestion of contaminated soil. In most areas, it would be sufficient to cover the contaminated soil with a layer of clean fill, as is already planned to bring the surface elevation in the Bay View area safely above the 100-year flood plain. Under Alternatives 2, 4 and 5, there would be housing and childcare in the Bay View area. NASA is currently conducting a Human Health Risk Assessment to predict site specific risk for exposure to dieldren, arsenic, and chromium.

As needed, where there is a possibility of children digging down through the layer of clean fill, a protective membrane would be installed to prevent it.

c. Navy, NASA, and MEW Companies Contaminants

As described in Section 3.7, a portion of the NRP and Ames Campus is located over the Regional Plume, a plume of groundwater contaminated with solvents and petroleum products. There are also a number of sites within the four planning areas known to be contaminated with hazardous materials. There would thus be a risk of exposing people or uncontaminated soil and groundwater to contamination through construction or demolition activities associated with the implementation of the NADP and through inhalation of vapors emanating from the Regional Plume. In addition, although Ames Research Center has been extensively tested for contamination, there would be

[1] Louise Hill. Indoor Environmental Program, EPA Region 9. May 24, 2001.

a possibility that new construction and demolition could expose previously unknown contamination.

Exposure to any of these hazardous materials above acceptable risk levels would be considered a significant impact. In order to evaluate this risk, NASA prepared a Human Health Risk Assessment (HHRA) to evaluate potential human health effects from possible exposure to hazardous chemicals in groundwater and soil from the Regional Plume, based on current and planned future land uses in the NRP area. Modeling of volatilization of contaminants from the groundwater, surface flux measurements, and direct measurements of volatile compounds in the air were used as the basis for evaluating the risk resulting from potential 10-year and 30-year exposure to inhalation of volatile organic chemicals (VOCs). The HHRA uses risk isoplasts to evaluate potential health risks to indoor workers, construction workers, outdoor maintenance workers, outdoor maintenance workers, students, visitors, adult residents, child residents, and children at childcare. The risk goal is 10^{-6} for the entire Ames Research Center.

The HHRA describes risks to a number of potential receptors from a variety of exposure pathways. Potential receptors are members of a population who may be exposed to contaminated soil, groundwater, or air during the course of daily living and working in areas over the plume. Up to eight receptors were evaluated for each area, depending on planned land uses: indoor workers, construction workers, outdoor maintenance workers, students, visitors, adult residents, child residents, and children at daycare. Potential receptors could be exposed to chemicals of potential concern by one or more of the following pathways: inhalation of volatile chemicals from groundwater and/or soil, inhalation of airborne suspended soil particles, incidental soil ingestion, and dermal absorption due to direct soil and/or groundwater contact. In general, the HHRA finds that most risks are below or within the EPA risk management range.

To address the risks associated with site contamination, NASA has prepared an Environmental Issue Management Plan (EIMP) that addresses potential hazardous materials exposure issues. The Final EIMP will be available in Fall 2002. The EIMP includes a set of minimum health and safety guidelines that must be followed by any developer at Ames Research Center to protect worker safety. The EIMP also includes land use guidelines based on the HHRA, as well as recommended construction practices to minimize exposure of on-site personnel to existing contaminants. Another key section of the EIMP describes mitigation measures to prevent the creation of horizontal or vertical conduits for the flow of contaminated groundwater. These measures apply to all utilities installed within 2 feet of the seasonal high elevation of the groundwater table or in areas with VOCs in the groundwater. The EIMP also outlines a process for removing existing utilities in order to prevent their becoming conduits for contaminated groundwater.

In addition, the EIMP includes a contingency plan for testing and treatment of any materials encountered during grading and digging operations that are suspected to be hazardous. The contingency plan includes sampling and assessment of results by a qualified individual to determine whether materials are actually hazardous. The EIMP is being reviewed by a number of local, State and federal agencies including the Environmental Protection Agency and the Regional Water Quality Control Board. Once the EIMP is approved, NASA, the MEW Companies, the Navy, and NASA's development partners will implement its recommendations and guidelines.

3. Hazardous Materials

Because Ames Research Center is home to a large number of research and development projects, many different hazardous substances are used there. As described in Section 3.7, at any given time there may be more than 5,000 types of toxic substances in the laboratories at Ames Research Center. NASA has an environmental management system that includes procedures and guidelines

(APG 8800.3) to control the hazards associated with toxic substances and to minimize the risks of exposure or spills.[2]

Under Alternatives 2 through 5, there would be new research and development uses that could include laboratories in either new or existing buildings where hazardous or radioactive materials could be utilized. New laboratory space could cause a significant impact if hazardous or radioactive materials were used or disposed of in a manner inconsistent with existing NASA protocols, or if these materials were not properly considered in Center-wide contingency plans.

In order to prevent significant impacts from the handling, use or disposal of hazardous or radioactive materials in the new laboratory space within Ames Research Center, new users (including non-NASA entities) would be required to follow all existing NASA protocols for dealing with such materials. In addition, NASA would reexamine all of its existing protocols regarding the handling, use and disposal of hazardous and radioactive materials in light of the development of new laboratory space. Specifically, NASA would update contingency plans to include the possibility of incidents within all four planning areas, expand all existing policies as necessary to include measures to address any circumstances unique to one of the planning areas, and expand monitoring and education programs to include researchers working outside of the Ames Campus area.

4. Off-site Adjacent Hazardous Materials

As described in Section 3.7, a portion of the Ames Campus area is located over a plume of contaminated groundwater originating in the adjacent Orion Park Military Housing area. This trichlorethylene-contaminated groundwater plume is migrating north towards Bay View, although it has not yet reached that area. NASA is planning to conduct interim remedial measures to prevent further plume migration. The US Navy is investigating this contamination.

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[2] *Ames Procedures and Guidelines (APG 8800.3) Environmental Management Handbook.*

The Navy, or another upgradient source, is responsible for its remediation. Given these plans, no significant impacts associated with this plume are expected.

Another potential source of off-site contamination is the Mountain View Industrial Park west of and adjacent to the Bay View area. Each of the alternatives includes some space for community facilities, such as childcare facilities, which would be sensitive to exposure. All childcare facilities in Mitigated Alternative 5 would be located at least 0.4 kilometers (1/4 mile) from the industrial area of Mountain View in compliance with City of Mountain View policy. Childcare facilities in Alternatives 2, 4, and 5 would be located at least 305 meters (1,000 feet) from the Mountain View industrial area.

5. Cumulative Impacts

As described above, the only potential hazardous materials and contamination impact of the proposed project would arise from exposure of people or uncontaminated soil or groundwater at Ames Research Center to known or unknown contaminants. Because the only potential impact is on-site and would be mitigated to less-than-significant levels by the implementation of the EIMP, there would be no impacts from the proposed project that could combine with the hazardous materials impacts of other projects in the region to create a cumulative impact.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact HAZ-1: New construction and demolition required to implement the NADP would establish new land uses and could expose the public or uncontaminated soil or water to existing site contamination.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure HAZ-1: NASA's development partners would work with the Remediation Project Manager within the Office of Environmental Services during site planning and would implement the guidelines and recommendations in the Environmental Issues Management Plan (EIMP) to ensure that none of the proposed construction, demolition, and infrastructure improvement projects would expose personnel to unacceptable levels of contaminated soil or groundwater. Where the Remediation Project Manager determined that there would be a possible risk of exposure to people or clean soil or groundwater, the proposed design would be altered to prevent such exposure if feasible. If it were not feasible to avoid exposure, protective measures would be undertaken to minimize the risk of exposure as described in the EIMP.

Impact HAZ-2: Proposed childcare facilities in the Bay View area could be located near the Mountain View Industrial Park, where some businesses handle hazardous materials. Spills or releases at these businesses could expose children to hazardous air pollution. This would be a significant impact.

Applicable to: Alternatives 2, 4, 5 and Mitigated Alternative 5

Mitigation Measure HAZ-2: In Alternatives 2 and 4, NASA or its partners would locate childcare facilities at least 305 meters (1,000 feet) from the industrial area of Mountain View, which would limit the area in which industries handling hazardous materials would be prohibited. Mitigated Alternative 5 would locate childcare facilities at least 402 meters (1,320 feet) from the industrial area of Mountain View in accordance with City of Mountain View policy.